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FIVE-YEAR REVIEW REPORT

For the

West Site/How's Corner Superfund Site

Plymouth

Penobscot County, Maine

September 2008

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Region 1
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WEST SITE/HOWS CORNER SUPERFUND SITE
FIVE-YEAR REVIEW

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List of Acronyms

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	United States Environmental Protection Agency
DNAPL	Dense, Non-Aqueous Phase Liquids
FYR	Five-Year Review
IC	Institutional control
ICZ	Institutional control zone
LTMP	Long-Term Monitoring Plan
MCL	Maximum Contaminant Level
MEDEP	Maine Department of Environmental Protection
MEG	Maine Maximum Exposure Guideline
Mg/kg	Milligrams per Kilogram
MW	Monitoring well
NCP	National Contingency Plan
NPL	National Priorities List
OU	Operable Unit
PPB	Parts Per Billion
PPM	Parts Per Million
PCE	Tetrachloroethylene
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SWQC	State Water Quality Criteria
TCA	1,1,1-trichloroethane
TCE	Trichloroethylene
VOC	Volatile Organic Compound
µg/L	Micrograms per Liter

ES EXECUTIVE SUMMARY

This is the first five-year review for the Hows Corner/West Site (Site) located in Plymouth, Maine. This statutory five-year review is required since hazardous contamination remains at the Site above levels that allow for unlimited use and unrestricted exposure. The review was completed in accordance with EPA guidance entitled "Comprehensive Five-Year Review Guidance," OSWER No. 9355.7-03B-P, June 2001.

From 1965 to 1980, George West operated a waste oil storage and transfer facility within a two-acre portion of his 17-acre parcel of land. Waste oils were stored in eight aboveground storage tanks ranging in volume from 1,000 to 20,000 gallons. According to documents obtained from Mr. West and other sources, in excess of 235,000 gallons of waste oil and other liquids were received at the facility for storage and transfer during operations. After separating the waste oils based on density, lighter oils were sold to greenhouses, paper companies, and others as fuels, and heavier oils were spread on dirt roads for dust control. Operations ceased in 1980, and the tanks were disassembled and sold as scrap.

Environmental investigations were initiated in 1988 by Maine Department of Environmental Protection after contaminated groundwater was discovered in a residential well that was sampled during a pre-purchase environmental assessment of Mr. West's property in 1987. MEDEP sampled other wells in the immediate area and found ten residential wells contaminated with chemicals often used as industrial solvents or degreasers. As an emergency response measure, MEDEP provided bottled water and installed dual in-line granular carbon filters to all homes with contaminated water. MEDEP completed a Preliminary Assessment of the Site in June 1989, and subsequently completed a preliminary groundwater investigation in March 1990. Based on the results of the preliminary investigations, and the desire to provide a permanent, safe water supply for nearby residents, MEDEP requested the assistance of EPA in July 1990 after determining that the costs to implement the necessary removal actions were beyond the resources available to MEDEP. Consequently, EPA completed a Removal Action in 1990-91 that included the installation of a fence around a two-acre portion of the property owned by Mr. West and the excavation and off-site disposal of approximately 847 tons of contaminated soil within this area. In March 1994, EPA completed construction of the public water supply system that provided safe water to 33 residences surrounding Mr. West's property, with the potential to provide water to several additional residences. The Site was placed on the National Priorities List in September 1995.

In October 1999, the West Site/Hows Corner Superfund Site Group of Potentially Responsible Parties (PRP Group) agreed to perform a Remedial Investigation/ Feasibility Study at the Site. The Remedial Investigation was initiated in October 1999 and included: groundwater, surface water, sediment, surface soil, and air sampling; installation of bedrock monitoring wells; residential well sampling; packer testing of bedrock wells; geophysical surveys and bedrock mapping; and computer modeling of groundwater and contaminant movement through the bedrock aquifer. Additional fieldwork was conducted in the spring of 2000 to supplement the fall 1999 sampling program. Data from the RI was then used to complete a Baseline Human Health and Ecological Risk Assessment Report. A final RI, including the baseline risk assessments was presented to EPA in July 2001. In the fall of 2001, the PRP Group performed a pilot study to assess the effectiveness of in-situ chemical oxidation in cleaning up the most contaminated groundwater at the Site. To gain access to the bedrock, the PRP Group removed about 850 tons of soil within the fenced area of the George West property. This soil was disposed of offsite as investigation derived waste at an appropriate waste disposal facility. Based upon the results of the study, EPA determined that in-situ chemical oxidation would not be sufficiently effective in addressing this contamination.

Following issuance of a Proposed Plan in June 2002, EPA signed an Interim ROD on September 24, 2002. This remedy focused on what was termed the Non-Source Area groundwater as there was insufficient data to select a remedy for the entire groundwater plume. The 2002 ROD also delineated between the Source Area groundwater and Non-Source Area groundwater at total contaminant concentrations of 10,000 parts per billion. The 2002 ROD (also referred to as the OU 1 ROD) included four major components: installation and operation of a hydraulic containment system to cut off the Source Area groundwater; implementation of institutional controls to prevent exposure to contaminated groundwater; access to public water; and long-term monitoring of groundwater, sediment and surface water.

In addition to these components, the 2002 ROD stated that additional characterization of the groundwater was needed in order to answer two questions that the 2002 ROD was unable to address. These questions were as follows: whether the Non-Source Area groundwater could attain applicable or relevant and appropriate requirements (ARARs) through monitored natural attenuation within a reasonable timeframe; and whether it was technically practicable to restore the Source Area groundwater to drinking water quality within a reasonable timeframe. As a result, additional fieldwork was performed in 2003 -2004, culminating in a Technical Impracticability Evaluation that was approved in June 2006.

On September 28, 2006, EPA issued a Final ROD (also referred to as the OU 2 ROD) that added to the 2002 ROD components a technical impracticability waiver of drinking water standards for the Source Area groundwater, confirmed that a monitored natural attenuation remedy for the Non-Source Area groundwater was appropriate, required investigation of and appropriate response to the potential vapor intrusion pathway from contaminated groundwater to indoor air; and five-year reviews.

While the technical impracticability evaluation was underway, the PRP Group voluntarily pursued implementation of institutional controls. Two types of institutional controls have been implemented, restrictive covenants on individual properties within the Site and a town ordinance. On August 11, 2003, the Town of Plymouth adopted a groundwater ordinance restricting groundwater use in a delineated area of the Site. As of December 2005, 48 of the 57 identified properties within the site boundaries that were required to have restrictions on their properties had signed restrictive covenants (including the George West property). Those remaining properties where restrictions have not been put in place are part of the residential water quality monitoring program. The trigger date for this five-year review was set as the date the groundwater ordinance was adopted.

Land use on properties surrounding the former George West property has not changed since the 2002 ROD and is not expected to change in the immediate future. Land use remains primarily residential. A few additional homes have been constructed since the 2002 ROD was issued, and these homes have been connected to the public water system.

This five-year review assesses the components of the 2002 ROD remedial action that have been implemented for the Site: institutional controls, residential water monitoring, and access to public water. EPA and MEDEP are currently negotiating the funding and performance of the remaining Remedial Design/ Remedial Action components with the PRP Group.

Five-Year Review Protectiveness Statement

The remedy components that have been implemented for the 2002 or OU 1 ROD currently and in the short term protect human health and the environment because voluntary institutional controls, residential water monitoring, and access to public water have been implemented. However, in order for the remedy to be protective in the long-term, the remaining components of the remedy need to be implemented: construction

and operation of the hydraulic containment system, long-term monitoring of groundwater, surface water, and sediments, establishment of compliance monitoring of the institutional controls, and an investigation of and appropriate response to the potential vapor intrusion pathway from contaminated groundwater to indoor air. A decision also is needed regarding those properties within the Institutional Control Zone that remain without restrictive covenants and how that might affect the long term protectiveness of the remedy.

The remedy components that have been implemented for the 2006 or OU 2 ROD currently and in the short term protect human health and the environment because voluntary institutional controls have been implemented (all of the homes located above Source Area groundwater were connected to public water during a Removal Action carried out by EPA in 1993-1994). However, in order for the remedy to be protective in the long-term, the remaining components of the remedy need to be implemented: construction and operation of the hydraulic containment system, long-term monitoring of groundwater, surface water, and sediments, establishment of compliance monitoring of the institutional controls, and an investigation of and appropriate response to the potential vapor intrusion pathway from contaminated groundwater to indoor air.

Five-Year Review Summary Form

SITE IDENTIFICATION
Site name (<i>from WasteLAN</i>): West Site/Hows Corner Superfund Site
EPA ID (<i>from WasteLAN</i>): MED985466168
Region: 1 State: ME City/County: Plymouth/Penobscot
SITE STATUS
NPL status: Added on September 29, 1995
Remediation status: Voluntary institutional controls have been implemented; construction of hydraulic containment system and vapor intrusion investigation have not yet started
Multiple OUs?* Yes Construction completion date: Not Applicable
Has site been put into reuse? N/A and No. The Site includes over fifty private properties, the majority of which continue to be residential so reuse is not applicable for these properties; and no, the property where the release occurred has not been put into reuse.
REVIEW STATUS
Lead agency: USEPA
Author name: Terrence Connelly
Author title: Remedial Project Manager
Author affiliation: EPA Region I
Period for this review: April 25, 2008 to September 30, 2008 (Time period covered by this review, 2003-2008)
Date of site inspection: July 23, 2008 Type of review: Post-SARA Review number: 1 st Triggering action: Adoption of a groundwater ordinance by the Town of Plymouth, Aug 11, 2003 Triggering action date (<i>from WasteLAN</i>): <u>08/23/2003</u> Due date (<i>five years after triggering action date</i>): <u>08/23/08</u>

Five-Year Review Summary Form, cont'd.**ISSUES:**

RD/RA negotiations have not been completed but it is assumed that an agreement will eventually be reached for the PRP Group to complete the remaining actions at the Site. While the PRPs have performed some activities voluntarily, until the RD/RA Consent Decree becomes effective, there is no enforcement document to ensure response actions necessary for protection of human health and the environment are implemented.

RECOMMENDATIONS and FOLLOW-UP ACTIONS:

Finish the RD/RA Consent Decree negotiations.

PROTECTIVENESS STATEMENT:

The remedy components that have been implemented for the 2002 or OU 1 ROD (Non-Source Area groundwater) currently and in the short term protect human health and the environment because voluntary institutional controls, residential water monitoring, and access to public water have been implemented. However, in order for the remedy to be protective in the long-term, the remaining components of the remedy need to be implemented: construction and operation of the hydraulic containment system, long-term monitoring of groundwater, surface water, and sediments, establishment of compliance monitoring of the institutional controls, and an investigation of and appropriate response to the potential vapor intrusion pathway from contaminated groundwater to indoor air. A decision also is needed regarding those properties within the Institutional Control Zone that remain without restrictive covenants and how that might affect the long term protectiveness of the remedy.

The remedy components that have been implemented for the 2006 or OU 2 ROD currently and in the short term protect human health and the environment because voluntary institutional controls have been implemented (all of the homes located above Source Area groundwater were connected to public water during a Removal Action carried out by EPA in 1993-1994). However, in order for the remedy to be protective in the long-term, the remaining components of the remedy need to be implemented: construction and operation of the hydraulic containment system, long-term monitoring of groundwater, surface water, and sediments, establishment of compliance monitoring of the institutional controls, and an investigation of and appropriate response to the potential vapor intrusion pathway from contaminated groundwater to indoor air.

OTHER COMMENTS:

1.0 INTRODUCTION

The purpose of this five-year review is to determine if the remedy selected in the 2002 Record of Decision (ROD) for the West Site/Howe's Corner Superfund Site (Site) in Plymouth, Maine, is protective of human health and the environment. This report summarizes the five-year review process, investigations and remedial actions undertaken at the Site; evaluates the monitoring data collected; reviews the Applicable or Relevant and Appropriate Requirements (ARARs) specified in the ROD for changes; discusses any issues identified during the review; and presents recommendations to address these issues.

The United States Environmental Protection Agency, Region 1 (EPA) prepared this five-year review pursuant to the Section 121 of the Comprehensive Environmental Response Compensation, and Liability Act (CERCLA) and the National Contingency Plan. CERCLA § 121 states:

"If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews."

The EPA interpreted this requirement further in the National Contingency Plan; 40 CFR § 300.430(f)(4)(ii) states:

"If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action."

This is the first five-year review for the Site. This statutory five-year review is required since hazardous contamination remains at the Site above levels that allow for unlimited use and unrestricted exposure. The triggering action for the initial statutory review was the adoption of a groundwater ordinance by the Town of Plymouth in August 2003.

Work on this review was performed between April and September 2008. The review was completed in accordance with EPA Guidance OSWER No. 9355.7-03B-P.

2.0 SITE CHRONOLOGY

Chronology of Site Events	
EVENT	DATE
George West operated a waste oil storage and transfer facility, using eight aboveground storage tanks	1965-1980
Operations ceased and the tanks were disassembled and sold as scrap	1980
MEDEP initiated an environmental investigation after contaminated groundwater was discovered in a residential well. MEDEP found ten residential wells contaminated with TCE and PCE and identified the Site as an uncontrolled hazardous substance site.	1988
MEDEP initiated a removal action to stabilize the Site, including removing approximately 120 transformers and 4500 gallons of waste oil. As an emergency response measure, MEDEP provided bottled water and installed dual in-line granular carbon filters to all homes with contaminated water	1988
MEDEP completed a Preliminary Assessment of the Site.	June 1989
MEDEP completed a preliminary groundwater investigation.	March 1990
MEDEP requested the assistance of EPA after determining that the costs to implement removal actions were beyond its available resources	July 1990
EPA completed a Removal Action that included the installation of a fence around a two-acre portion of the George West property and the excavation and off-site disposal of approximately 847 tons of contaminated soil within this area.	1990-1991
EPA completed construction of the public water supply system that provided safe water to 33 residences surrounding the Source Area, with the potential to provide water to several additional residences.	March 1994
The Site was placed on the NPL	September 1995
EPA transferred all of its interest in the public water supply system to the State of Maine.	December 1995
EPA issued General Notice letters	May 1998
An AOC for continued monitoring of residential wells with contingency for public water connections was signed by approximately fifteen PRPs	May 1998
The PRP Group (over 100 parties) agreed to perform an RI/FS	October 1999
This agreement was formalized in an Administrative Order with EPA	May 2000
A final RI, including the baseline risk assessments, was submitted to EPA	July 2000
State of Maine conveyed all of its interest in the public water supply system to the Plymouth Water District	August 2001

The PRP Group performed a pilot study to assess the effectiveness of in-situ chemical oxidation in remediating the Source Area. To gain access to the bedrock, the PRP Group removed about 850 tons of soil within the fenced area. This soil was disposed of offsite at an appropriate waste disposal facility.	Fall 2001
A Consent Decree, signed by EPA and over 130 PRPs to resolve each PRP's financial liability for past costs incurred at the Site, was entered in U.S. District Court	December 2001
A second Consent Decree, signed by EPA and approximately 80 PRPS to resolve each PRP's financial ability to pay, was entered in US District Court	April 2002
EPA issued an Interim ROD for the Non-Source Area groundwater	September 2002
Town of Plymouth adopted a groundwater ordinance to prohibit use of groundwater in vicinity of Site	August 2003
PRP Group conducted field work for a technical impracticability evaluation	2003-2004
EPA, MEDEP, and PRPs signed an AOC for Hydraulic Containment Remedial Design	May 2004
EPA issued a Final ROD	September 2006
EPA issued Special Notice letters to approximately 100 PRPs commencing negotiations of an RD/RA Consent Decree	May 2007
EPA conditionally approved Hydraulic Containment RD	September 2007
EPA began first five-year review for the Site	April 2008

3.0 BACKGROUND

3.1 Physical Characteristics

The Site is situated in a rural section of east-central Maine in the Town of Plymouth (Figure 1). The Site includes the 17-acre George West property and all areas where groundwater contamination has come to be located (Figure 2). The George West property, with the exception of the fenced two-acre area, (Source Area) has naturally re-vegetated after being clear-cut around 1990. Within the fenced area, there has also been some regrowth but on a lesser scale because much of the soil was removed in 2001 to gain access to the bedrock. The two-acre portion is located along Sawyer Road, and topographically, it occupies a local high spot. Bedrock is exposed at the surface for much of the two acres. The immediate surface elevation surrounding the Source Area decreases in all directions, with a regionally steeper drop to the north, east, and west. A small, unnamed pond and associated wetlands abut the eastern side of the Source Area. Plymouth Pond is located approximately one-half mile to the north of the Source Area, and Martins Stream, which flows northerly to drain into the eastern end of Plymouth Pond, is located approximately three quarters of a mile east of the Source Area. The closest residence is located approximately 100 feet to the south on the opposite side of Sawyer Road.

The surficial materials at the Site are comprised of various sands and compacted sand, silt, and gravel deposits placed during the advancement and retreat of glacial ice sheets. Glacial till is the most extensive surficial deposit within the Site, and is the only deposit underlying the George West property. This till lies in direct contact with the bedrock and while it is laterally extensive, it is also discontinuous at higher elevations. The till is comprised of a heterogeneous mixture of sands, silts, clays, and gravels and varies in density from dense to loose. Within the Source Area, these unconsolidated soils range from zero to five feet. Deposits outside of the Source Area are generally thicker, but for the most part, unsaturated at the higher elevations in the area.

The bedrock geology beneath the Site consists of alternating layers of metasedimentary rock of phyllite grade with the majority of fractures occurring in the top 85 feet. Three sets of bedrock fractures have been mapped at the Site with the primary set of fractures having a strike running northeast to southwest, and a near vertical dip. Observations made during drilling indicate that the bedrock becomes more competent with depth and to the west of the Site. Groundwater flow beneath the Source Area is entirely in bedrock and discharges upward to the overburden soils as it moves away from the Source Area along the flanks and bottom of the hill. As noted above, bedrock within the Source Area is exposed because of previous removal actions undertaken at the Site. Other bedrock outcrops are visible outside the Source Area.

3.2 Land and Resource Use

With the exception of an operating gravel borrow pit northwest of the West property that is accessible from Route 7, the area surrounding the George West property is primarily residential or agricultural and it is assumed that the area will continue to be used for these purposes for the foreseeable future. The 17-acre West property is currently inactive with no existing building or structures other than the fence surrounding the 2-acre Source Area. The Source Area is essentially cleared although there are trees along the fence line. The majority of the area within the fence is exposed to bedrock. Groundwater underlying this property is currently unsuitable as a drinking water source. Reasonably anticipated reuse options of the

West property would likely be limited to areas outside of the Source Area and could include residential or conservation/recreational uses as these would be consistent with the historical use of the property and would likely be compatible with the surrounding residential properties. Because it is anticipated that Non-Source Area groundwater will attain federal and state drinking water quality standards within a reasonable timeframe upon the implementation and operation of the hydraulic containment system, a reasonably anticipated reuse option for the Non-Source Area groundwater includes its use as a drinking water source.

3.3 History of Contamination

From 1965 to 1980, Mr. West operated a waste oil storage and transfer facility within a two-acre portion of his 17-acre parcel of land. Waste oils were stored in eight aboveground storage tanks ranging in volume from 1,000 to 20,000 gallons. According to documents obtained from Mr. West and other sources, in excess of 235,000 gallons of waste oil and other liquids were received at the facility for storage and transfer during operations. After separating the waste oils based on density, lighter oils were sold to greenhouses, paper companies, and others as fuels, and heavier oils were spread on dirt roads for dust control. Operations ceased in 1980, and the tanks were disassembled and sold as scrap.

3.4 Initial Response

MEDEP initiated environmental investigations in 1988 after contaminated groundwater was discovered in a residential well that was sampled during a pre-purchase environmental assessment of Mr. West's property in 1987. MEDEP sampled other wells in the immediate area and found 10 residential wells contaminated with chemicals often used as industrial solvents or degreasers (e.g., tetrachlorethene "PCE", and trichloroethylene "TCE"). As an emergency response measure, MEDEP provided bottled water and installed dual in-line granular carbon filters to all homes with contaminated water. MEDEP completed a Preliminary Assessment of the Site in June 1989, and subsequently completed a preliminary groundwater investigation in March 1990. Based on the results of the preliminary investigations, and the desire to provide a permanent, safe water supply for nearby residents, MEDEP requested the assistance of EPA in July 1990 after determining that the costs to implement the necessary removal actions were beyond the resources available to MEDEP. Consequently, EPA completed a Removal Action in 1990-91 that included the installation of a fence around the two-acre Source Area and the excavation and off-site disposal of approximately 847 tons of contaminated soil within this area. In March 1994, EPA completed construction of the public water supply system that provided safe water to 33 residences surrounding the Source Area, with the potential to provide water to several additional residences. The Site was placed on the NPL in September 1995.

The Remedial Investigation was initiated in October 1999 and included: surface soil, groundwater, surface water, sediment, and air sampling; installation of bedrock monitoring wells; residential well sampling; packer testing of bedrock wells; geophysical surveys and bedrock mapping; and computer modeling of groundwater and contaminant movement through the bedrock aquifer. Additional fieldwork was performed in the spring 2000 to supplement the fall 1999 sampling program. Data from the RI was then used to complete a Baseline Human Health and Ecological Risk Assessment Report. A final RI, including the baseline risk assessments was submitted to EPA and MEDEP in July 2001. In the fall of 2001, the PRP Group performed a pilot study to assess the effectiveness of in-situ chemical oxidation in remediating the Source Area. To gain access to the bedrock, the PRP Group removed about 850 tons of soil within the

fenced area of the West property. This soil was disposed of offsite as investigation derived waste at an appropriate waste disposal facility. Based upon the results of the study, EPA determined that in-situ chemical oxidation would not be effective in addressing this contamination.

Surface and shallow soil samples were collected from 42 locations during the RI. Samples were collected from within the 2-acre Source Area and at locations more than 100 feet away from the Source Area. An additional five locations within the Source Area were sampled during the in-situ chemical oxidation pilot study conducted in September 2001 as this activity resulted in the excavation and off-site disposal of soils that were represented by 14 of the 42 locations previously sampled. Soil samples were analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, polychlorinated biphenyls (PCBs), and inorganics (metals). Based on the analytical results, soils remaining within the Source Area did not contain significant levels of contaminants when compared to soil screening values (i.e., EPA Region 9 Preliminary Remediation Goals) or background concentrations located outside of the Source Area.

Three groundwater sampling events were performed as part of the RI/FS and two additional groundwater sampling events were performed after the 2002 ROD for the technical impracticability evaluation. During the RI/FS, groundwater samples were collected from 24 existing MEDEP monitoring wells, 24 monitoring wells installed in the RI, and 25 residential wells. The samples were analyzed for a full range of contaminants (VOCs, SVOCs, PCBs, and metals). The post-2002 ROD sampling included 21 existing wells and 8 new wells that were analyzed for VOCs.

Thirteen monitoring wells are located within the Source Area. Both historical data and the results of the three RI sampling events show this area to have the highest concentrations of VOCs with PCE being the dominant compound. Concentrations of PCE ranged from a low of 410 ppb at MW-101I to a high of 32,000 ppb at MW-104I. Other VOCs detected at high concentrations within the Source Area include: TCE, cis-1,2-dichloroethene, and 1,1,1-trichloroethane. PCBs were detected in groundwater in three wells within the Source Area. The pesticide dieldrin was detected in one Source Area well at a concentration in excess of its MEG. Arsenic was detected in one Source Area well (MW-21B) and at a concentration below its MCL, it was also detected in excess of the MCL in samples from various distances and directions from the Source Area: 300 feet and 2,200 feet north (MW-5B and MW-17SO); 1,300 feet south (MW-111D); and 500 feet west (MW-4O). Manganese does appear to be site-related. While manganese has been detected at or above its MEG in Source Area groundwater wells (e.g., MW-101S, MW-2DB) and Non-Source Area groundwater wells (MW-110D, MW-106S), the highest manganese concentrations have been detected in Source Area groundwater wells. (see Figure 3 for the location of the monitoring wells)

Surface water and sediment sampling found low concentrations of VOCs in some small ponds and wetlands near the West property, but VOCs were not detected in Plymouth Pond. VOCs are migrating in contaminated groundwater that discharges to the surface at seeps or surface water bodies.

Ambient air was sampled during the RI to assess the potential for soil contaminated by VOCs to adversely affect ambient air by off-gassing from the Source Area. Air sampling locations were chosen to be representative of the Source Area, and at upwind/downwind locations. Because acetone was the only VOC detected, off-gassing of VOCs into air was not an issue at the time of 2002 ROD given that acetone was not found in soil at significant concentrations, and it is a common laboratory contaminant.

3.5 Basis for Taking Action

Baseline human health and ecological risk assessments (HHRA and ERA, respectively) were performed to estimate the probability and magnitude of potential adverse human health and environmental effects from exposure to contaminants associated with the Site assuming no remedial action was taken. The risk assessment provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action.

The HHRA evaluated risks from contaminants found in surface water, sediment, soil, and groundwater. Health risks attributed to contaminants detected in surface water, sediment, and soil were deemed acceptable whereas the risks attributed to exposure to groundwater contamination were not. Twenty-three of the sixty-two chemicals detected in groundwater (Source Area and Non-Source Area) were selected for evaluation in the HHRA as chemicals of potential concern. These chemicals were selected to represent potential site-related hazards based on toxicity, concentration, frequency of detection, and mobility and persistence in the environment.

The HHRA evaluated a potential future residential groundwater exposure scenario for Source Area and Non-Source Area groundwater. The estimated cancer risks and non-carcinogenic risks for groundwater exposure exceeded EPA and MEDEP upper bound limits of acceptable risk. The compounds contributing the most to the risk for groundwater exposure included PCE, TCE and PCBs. Additional chemicals that exceeded EPA target risk levels and/or MCLs/ MEGs were 1,1-DCE, arsenic, manganese, 1,1,1-TCA, cis-1,2-DCE, 1,2,4,-trichlorobenzene, 1,1,1,2-tetrachloroethane, 1,4-dichlorobenzene, benzene, tetrahydrofuran, bis(2-ethylhexyl)phthalate, and dieldren. Based on this assessment, both Source Area and Non-Source Area groundwater were considered not suitable for domestic water supply source.

The ERA was completed to evaluate the likelihood and magnitude of potential ecological effects associated with the discharge of Source Area groundwater to nearby surface water bodies. Since contaminant concentrations in the three ponds closest to the Source Area were below benchmark values, or in the case of lead, below background, surface water was not considered to be an exposure medium of concern. Sediments in the three ponds were also evaluated in the ERA. The risks from exposure to sediments in the two ponds with detected contaminants were not considered to be an issue because the risk measurement for each contaminant were not significantly above the threshold value despite the conservative assumptions used throughout the ERA. Any effects were expected to be limited because of the small size of the ponds and the limited exposure potential to these two ponds.

In summary, the baseline HHRA revealed that if in the future residents were to use the groundwater as a long-term water supply, it would present an unacceptable human health risk (e.g., groundwater concentrations exceeded EPA and MEDEP drinking water standards). Therefore, actual or threatened releases of hazardous substances from the Site, if not addressed by implementing the response action selected in the 2002 ROD, could present an imminent and substantial endangerment to public health, welfare, or the environment.

4.0 REMEDIAL ACTION

This section describes the remedial action selected in the 2002 and 2006 RODs and that will be implemented at the Site.

4.1 Remedy Selection (2002 ROD)

The 2002 ROD specified a multi-component remedy to address groundwater contamination. Based on the RI, four remedial action objectives were identified:

- Prevent the use of groundwater containing contaminants that exceed federal or state MCLs, MCLGs, MEGs, or, an excess cancer risk of 1×10^{-6} or a hazard quotient of 1;
- Contain Source Area groundwater within the 2-acre fenced area of the Site and manage the migration of contaminants throughout the groundwater plume;
- Restore groundwater outside of the 2-acre fenced area of the Site (i.e., Non-Source Area groundwater) to meet federal or state MCLs, MCLGs, MEGs, or an excess cancer risk of 1×10^{-6} or a hazard quotient of 1; and
- Perform long-term monitoring of surface water, sediments, and groundwater to verify that the cleanup actions at the Site are protective of human health and the environment.

The remedy selected in the 2002 ROD addressed three of these objectives through the following components:

- Implement institutional controls;
- Install a hydraulic containment system to prevent further migration of highly contaminated groundwater from the Source Area to the Non-Source Area;
- Regular monitoring and provisions for water supply connections to the Plymouth Water District; and
- Five-year reviews.

What remained was whether the third remedial action objective listed above, which required Non-Source Area groundwater to be restored to drinking water quality within a reasonable timeframe through monitored natural attenuation, could be met.

4.2 Remedy Selection (2006 ROD)

The 2006 ROD added two remedial action objectives:

- Determine whether or not it is technically practicable to restore Source Area groundwater to meet

federal or state MCLs, MCLGs, MEGs, or an excess cancer risk of 1×10^{-6} or a hazard quotient of 1; and

- Prevent exposure to vapor intrusion coming from the groundwater that presents an unacceptable risk to human health.

The remedy selected in the 2006 ROD addressed these objectives through the following components:

- A determination that with the installation and operation of the groundwater containment system, restoration of the Non-Source Area groundwater will occur within a reasonable timeframe through monitored natural attenuation (MNA);
- A technical impracticability waiver for the Source Area groundwater; and
- An investigation of and response to, if necessary, the potential vapor intrusion pathway from the contaminated groundwater into indoor air.

The primary expected outcome of the selected remedy was that through hydraulic containment of the Source Area groundwater, the Non-Source Area groundwater could be restored through natural attenuation and returned to a viable drinking water source for future users. The 2006 Final ROD estimated it would take approximately 40-80 years to attain this outcome. Additionally, the selected remedy would also address the vapor intrusion pathway.

4.3 Remedy Implementation

This section describes the implementation of the components of the remedy specified in the 2002 and 2006 RODs.

4.3.1 Institutional Controls

Since the signing of the 2002 ROD, just over 80% of the properties within what has been designated as the Institutional Control Zone (ICZ) now have restrictive covenants preventing the use of the groundwater. In August 2003 the Town of Plymouth adopted an ordinance restricting the use of groundwater within a designated area.

4.3.2 Hydraulic Containment System

The design of the Hydraulic Containment System was completed in October 2007. Negotiations with the PRPs for the construction and operation of the system are underway.

4.3.3 Long-Term Residential Monitoring

EPA implemented a residential well monitoring program in 1996 to prevent the consumption of contaminated groundwater by residents in the vicinity of the West property. This monitoring program focused on residences that had not been connected to the public water supply system as part of the earlier removal action.

In May 1998 EPA and the PRP Group signed an Administrative Order on Consent (AOC) for a time-critical removal action. This AOC required the PRP Group to sample residential tap water and to provide alternate water for human consumption within 48 hours if MCLs were exceeded and within seven days for all other domestic uses. The PRP Group's responsibilities for this AOC ended in November 1999, 18 months after the effective date of the AOC.

The program initially involved monthly, quarterly, or annual sampling and VOC analysis of tap water, depending upon potential for exposure, and the reporting of the results, along with an explanation of the significance of any VOCs detected by sampling. A letter was sent to the residents and a monthly report was sent to EPA that presented the analytical data, data validation, and screening of detections against MCLs. The monitoring program also included, and continues to include, a periodic inspection of specified residences in the vicinity of the West property that are unoccupied. If a residence becomes occupied, the status of the residence is changed from inspection to monitoring.

The May 2000 RI/FS AOC Statement of Work (Sec 3.IV.G) required the PRP Group to monitor onsite and residential groundwater beginning with the Phase 1A field work and continuing until the issuance of the ROD. The PRP Group's responsibilities for residential monitoring ended with the issuance of the 2002 ROD. However, the PRPs are voluntarily continuing this monitoring.

4.3.4 Provisions for Public Water Connections

EPA constructed the original public water supply system for the Site in 1994, using a water source located approximately 1.25 miles west of the Site. The original system consisted of extraction wells (which extract groundwater from bedrock fractures outside the area of contaminated groundwater), a pump station, and a water distribution network. The system initially included nearly 20,000 feet of pipe serving 37 residential dwellings, 35 of which were located within what would later be designated as the ICZ.

In December 1995, EPA transferred all of its interest in the public water supply system to the State of Maine, and on August 30, 2001 the State conveyed all of its interest in the public water supply system to the Plymouth Water District, which was chartered in the early 1990s to serve residents in the ICZ.

4.3.5 Vapor Intrusion

In February 2007, EPA conducted a preliminary vapor intrusion study of homes within the immediate vicinity of the George West property. This included the collection of ambient air samples, sub-slab samples where applicable, and both instantaneous and 24-hour indoor air samples.

4.3.6 Five-Year Reviews

This is the first five-year review for the Site.

5.0 PROGRESS SINCE LAST FIVE-YEAR REVIEW

This is the first five-year review for the Site.

6.0 FIVE-YEAR REVIEW PROCESS

6.1 Administrative Components

EPA, the lead agency for this five-year review, notified MEDEP and the PRPs in the spring of 2008 that the five-year review would be completed. Rebecca Hewett of MEDEP was part of the review team. The schedule established by EPA included completion of the review by September 2008.

6.2 Community Notification and Involvement

EPA prepared a public notice announcing the five-year review and requesting public participation. The notice was published in the Bangor Daily News, the major local newspaper of daily circulation. Since the publication of the public notice, there has been no response from the public to either EPA or MEDEP regarding the five-year review.

6.3 Document Review

This five-year review included a review of relevant documents that provide information on the components of the remedy that have been implemented to date. These include decision documents and data reports. See Attachment A for a list of documents.

6.4 Data Review

A review was completed of the residential water quality monitoring reports. A summary of the residential water quality data is presented below followed by a synopsis of the long-term monitoring program.

6.4.1 Residential Water Quality Monitoring

The residential monitoring program initially collected samples from more than 30 residences. As residences were connected to the public water supply, they were removed from the residential sampling program, thereby reducing the number of residences that are monitored. By 2005 the program included 19 residences on 18 lots, 13 of which were monitored on a quarterly basis and six on an annual basis. All six of the wells located on lots that are wholly or partially within the Institutional Control Zone were sampled quarterly. By June 2008, the number of residences remaining in the program had been reduced to twelve residences sampled quarterly and four residences sampled annually. While there have been sporadic detections of site-related contaminants, these detections have been at concentrations near the detection limits and well below federal and state drinking water standards.

As part of the Long-term Monitoring Plan (LTMP) submitted to EPA and MEDEP as part of the Hydraulic Containment Design, tap water samples from nine residences will continue to be collected for VOCs analysis either annually or biennially. Two additional residences that were unoccupied at the time the Plan was submitted will be checked at the time of sampling and included in the program if they are occupied at that time. Should settlement be reached with the PRPs for implementation of the RD/RA, the LTMP will be followed. Figure 4 is a representative illustration of the ongoing residential water quality monitoring program.

6.4.2 Access to Public Water

Through voluntary efforts of the PRP Group since 2001, significant improvements have been made to the public water system increasing its storage capacity, its reliability, and its coverage. Specifically, more than 4,000 feet of pipe have been added by extending the water main along Loud Road, Hopkins Road, and State Route 7. This extension and upgrade has enabled the PRP Group to connect 20 additional residences. Additionally, a 140,000 gallon water storage tank and a water level control system were engineered and added to the water system to improve the system's capacity, reliability and flow control. The PRP Group has conveyed the ownership of these improvements to the Plymouth Water District.

Since 2001, the PRP Group has sought to connect all remaining residences within the ICZ to the public water system such that by December 2005, 53 of the 77 lots inside or partially inside the ICZ, have been connected to the public water system. Because of these efforts, every property owner within the ICZ who has consented to be connected to the public water system has been connected or has the PRPs' commitment to be connected during the next construction season. Figure 5 depicts the status of the public water system as of December 2005.

Of the 24 lots that lie completely or partly within the ICZ and are not connected to the public water system, eleven of the 24 lots are undeveloped (i.e. without a structure). Of the 13 lots with structures, only five have wells and structures in the ICZ. Three of these property owners have refused to connect to the public water system. However, the residential well monitoring program periodically requires sampling of the wells on these properties and should unacceptable levels of contamination be found, these properties would immediately be supplied with a safe source of water. As noted above, results from these homes as well as the other homes in the residential sampling program have met federal and state drinking water standards.

6.4.2 Long-Term Monitoring

The 2002 ROD specified that long-term monitoring of groundwater, surface water, and sediments would be performed to evaluate the success of the remedial action (Figure 6). In 2007, the PRP Group voluntarily agreed to collect groundwater samples from monitoring wells. EPA and MEDEP agreed that this sampling event would serve as the first of two baseline sampling events that are required in the Long-Term Monitoring Plan that was submitted with the Hydraulic Containment System design.

Forty-five wells were sampled as part of the baseline sampling event in October 2007. Overall, the results of this sampling were similar to previous results and were consistent with the conceptual model for the Site.

Surface water and sediment samples have not been collected since the 2002 ROD. Surface water and sediment sampling will be part of the Long-Term Monitoring program.

6.4.3 Vapor Intrusion

After the 2002 ROD was signed, EPA issued a guidance document addressing the potential for vapors to move from contaminated groundwater into indoor air spaces. This guidance was developed after VOC contaminants, partitioning into the gaseous phase from the dissolved aqueous phase, were found migrating through low pressure zones (such as higher permeable soils or utility trenches) into buildings at other sites.

This possible pathway could be present above the Hows Corner groundwater plume.

The 2006 ROD identified this as a potential exposure pathway and included an investigation to determine the nature and extent of the pathway. Should the results of this investigation indicate that an unacceptable risk is present, then appropriate response actions would be taken

In 2007, EPA began a preliminary study of homes closest to the West property. In February 2007, air samples were collected from ten homes. Depending on their construction, samples were collected from outdoor air, sub-slab, basement, and living space locations. The results of this preliminary investigation indicated that the pathway did exist as low levels were detected in a few homes. These results did not indicate any risk outside the acceptable risk ranges established by EPA and MEDEP, but with the presence of the pathway confirmed, follow-up investigations will be performed as part of the remedial action.

6.4.4 Institutional Controls

In May 1998 EPA and the PRP Group signed an Administrative Order on Consent (AOC) for a time-critical removal action. This AOC required the PRP Group to assist the town, MEDEP, EPA in identifying and developing institutional controls. The PRP Group's responsibilities for this AOC ended in November 1999, 18 months after the effective date of the AOC.

The 2002 ROD required institutional controls to be placed on the George West property and all properties beyond the George West property where the groundwater plume has migrated beneath or could reasonably be expected to migrate beneath (i.e., the ICZ). EPA would develop specific institutional control mechanisms (for example, a municipal ordinance, restrictive covenants, deed notices) in partnership with Town of Plymouth officials, landowners, and MEDEP.

Although not required to do so by EPA, the PRP Group worked with the Town of Plymouth, MEDEP and affected landowners to begin the process of putting institutional controls in place. These efforts were summarized in the Technical Impracticability evaluation submitted by the PRPs in December 2005. This report provided details regarding a town ordinance that was put in place preventing the use of groundwater and identified the restrictive covenants that had been placed on properties within the ICZ. As noted above, over 80% of the properties within the ICZ (the same area identified in the Town of Plymouth groundwater ordinance) have restrictive covenants. Of the remaining thirteen properties without restrictive covenants, only five have homes built on them. All of these homes are included in the ongoing residential monitoring program. The PRP Group continues to pursue restrictive covenants with the remaining property owners and has stated that it is prepared to connect these homes to the public water supply once agreement has been reached with the owners.

6.5 Site Inspection

A site inspection specifically for the five-year review was performed on July 23, 2008. The inspection was performed by representatives from EPA, MEDEP and the PRPs' contractor.

The inspection included a site walkover and inspection of some of the monitoring wells and the Source Area fence. Following the site inspection, EPA and MEDEP representatives drove to the Plymouth Water District well field and water tower and around the roads contiguous to the Site to check for new homes and developments.

There have been no significant changes on the West property since the 2004 technical impracticability fieldwork. The property outside the fenced area remains a mixture of fields and woods. The small wetland east of the fenced area, the "Site Pond" had little standing water consistent with the season. Trees are established on both sides of the fence. Several of the monitoring wells outside the fence were inspected and all were secured with casing covers and locks.

Within the central portion of the fenced area, there is limited vegetation since much of the topsoil was removed either during EPA's 1990 action or by the PRPs in 2001 to gain access to the bedrock. The fracturing of the bedrock is readily visible, yet there are also depressions in the now exposed bedrock that contain standing water (i.e., the fracturing is either not complete throughout the entire bedrock at the surface or the apertures of the fractures are so small that infiltration of rainwater is prevented). While the gates of the fence remain locked, there were several signs of vandalism within the fenced area: locks broken and casing covers removed from some of the monitoring wells, and bullet markings on warning signs from inside the fenced area.

The roads surrounding the Site were driven to check for new development/new use. The area remains predominantly rural residential interspersed with agricultural properties. There did not appear to be any significant changes on Sawyer, Old Farm, Hopkins, Loud, and Small Roads, or Route 7/Moosehead Trail.

See Attachment B for the site inspection checklist.

6.6 Interviews

EPA conducted interviews with representatives from MEDEP, Town of Plymouth, and Plymouth Water District officials. EPA visited the office of the Town of Plymouth and obtained an updated map with property owners' names. The town clerk did not raise any issues or concerns with the Site.

Rebecca Hewett has been the MEDEP project manager since 2004, and she provided MEDEP's comments on the Site. MEDEP has been actively involved with the Site since the beginning investigations and more recently, the technical impracticability evaluation, 2006 ROD, Hydraulic Containment design, institutional controls, and the ongoing RD/RA negotiations.

Ms. Hewett noted that the MEGs have just been updated in July 2008, but that the values for the site-related compounds have not changed since the 2000 values and that the 1992 MEGs remain as the Site's ARARs, as they are the promulgated state regulations. In addition, Maine has adopted the Uniform Environmental Covenants Act (UECA), which pertains to environmental restrictive covenants placed on deeds of properties.

Having participated in the oversight of the Hydraulic Containment design and the ongoing RD/RA negotiations, Ms. Hewett looks forward to the completion of the negotiations and the construction and implementation of the containment system. Ms. Hewett reiterated the State's position that the containment system have as little affect (noise, lights, traffic) as possible on neighboring properties.

The comments of MEDEP on the draft Five-Year Review Report are included in Attachment C.

The Plymouth town office serves as the repository for the site file. The site files include the

administrative records compiled for the 2002 Interim ROD and the 2006 Final ROD. The town clerk noted that the record is not often accessed but that it is appreciated by the community members who are interested in the Site.

7.0 TECHNICAL ASSESSMENT

This section evaluates only those components of the remedy that have been implemented: institutional controls, residential water quality monitoring, and access to public water. Components of the remedy that have not been implemented; hydraulic containment system, long-term monitoring, vapor intrusion investigation and response if needed, are not evaluated relative to Questions A, B, and C.

7.1 Question A: Is The Remedy Functioning As Intended By The Decision Documents?

Yes.

Layered institutional controls have been put in place through voluntary efforts by the PRPs and the Town of Plymouth. As of December 2005, 48 of the 57 identified properties within the site boundaries that were required to have restrictions on their properties had signed restrictive covenants. Those remaining properties where restrictions have not been put in place are part of the residential water quality monitoring program. Although most of the required institutional controls are in place, enforcement of the town's ordinance is uncertain and there are no enforceable requirements in place to monitor compliance with the restrictive covenants placed on the properties within the site boundaries. Residential water quality monitoring and access to public water continues. Since its inception, the number of homes that are monitored has decreased as homes have been connected to the public water system. The most recent monitoring has not detected any site-related contaminants in the homes remaining in the residential water quality monitoring program. The last connection to the public water system occurred in 2006.

By connecting residents located in the ICZ to a public water system, withdrawal of the groundwater underlying the ICZ has been almost completely eliminated over the past ten years. This process has served the dual objective of eliminating risk from exposure to contaminated groundwater and also eliminating potential hydraulic stress on the contaminant plume that may occur when groundwater is withdrawn.

7.2 Question B: Are The Exposure Assumptions, Toxicity Data, Cleanup Levels And Remedial Action Objectives (RAOs) Used At The Time Of Remedy Selection Still Valid?

Yes.

Changes in Standards and TBCs. As part of this five-year review, ARARs and To Be Considered (TBC) guidance for the Site presented in the 2002 ROD were reviewed, and a review of current ARARs was conducted. There have been some updated citations for State ARARs, but no changes in the chemical-specific ARARs (MCLs or Maine MEGs¹) for the contaminants identified in the RODs, location or action-specific ARARs. ARARs identified in the RODs and current ARARs and TBCs applicable to this five-year review are included in Appendix D of this report for reference.

Changes in Exposure Pathways. Shortly after the 2002 ROD, EPA issued draft guidance on the vapor

¹ Maine MEGs have been updated since the 2006 ROD; however, the 1992 MEGs are the only values that are promulgated, and therefore they remain as ARARs whereas the updates are TBCs.

intrusion pathway. Since this exposure pathway was not evaluated for the 2002 ROD, it was included in the 2006 ROD. A preliminary study by EPA found that the pathway does exist at the Site, though the extent of the pathway and the magnitude of the exposure are not known at this time. The data from the preliminary study did not suggest an unacceptable risk to human health but because the pathway does exist, a more comprehensive investigation will be performed to determine its nature and extent.

Land use around at the Site has not changed appreciably since the 2006 ROD, and is not expected to significantly change. EPA will continue to inspect the area on a regular basis to assure that should there be any changes in the land use, it will not affect the plume configuration.

Changes in Toxicity and Other Contaminant Characteristics. There have not been any changes in toxicity or other contaminant characteristics since the 2006 ROD.

Changes in Risk Assessment Methods. There have been no changes in risk assessment methods since the 2006 ROD.

Expected Progress Towards Meeting RAOs. As listed in Sections 4.1 and 4.2 above, six RAOs were set in the two RODs. One has formally been met: a determination that it is technically impracticable to restore the Source Area groundwater within a reasonable timeframe. A second RAO is currently being met through voluntary institutional controls and residential monitoring: preventing the use of groundwater containing contaminants above state and federal standards. The other four RAOs have not been met.

Assuming a settlement can be reached with the PRP Group for them to conduct the RD/RA, then containment of the Source Area groundwater, implementation of the long-term monitoring program, and the prevention of vapor intrusion exposure will occur within the following two years.

Attainment of the remaining RAO, restoration of the Non-Source Area groundwater, is expected to be met within 40-80 years after implementation of the Hydraulic Containment System.

7.3 Question C: Has Any Other Information Come To Light That Could Call Into Question The Protectiveness Of The Remedy?

No.

7.4 Technical Assessment Summary

When the components of the remedy that have been implemented are viewed together, the institutional controls, residential water quality monitoring, and access to public water, the overall effect is that the remedy is functioning as intended by the 2002 ROD. Because measures to monitor compliance in the long term have not yet been put in place, there is some uncertainty as to the long term effectiveness of the institutional controls. A decision is also needed regarding whether those properties where restrictive covenants were required but have not occurred should still be required to have restrictive covenants in order to ensure the long term protectiveness of the remedy.

When the remaining components of the remedy are implemented, it is expected that the remedy will function as intended.

8.0 ISSUES

In assessing the components of the remedy that have been implemented since the 2002 ROD, this five-year review has identified two issues. The first is the lack of compliance monitoring of the institutional controls. This issue has been identified in the ongoing RD/RA negotiations with the PRP Group and it is the expectation of EPA and MEDEP that it will be addressed as part of these negotiations. A decision also is needed regarding those properties within the Institutional Control Zone that remain without restrictive covenants and how that might affect the long term protectiveness of the remedy.

Issues

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Lack of compliance monitoring	N	Y- Potentially
Resolution for properties without restrictive covenants	N	Y – Potentially

9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Finish the RD/RA negotiations. Until there is an enforceable document in place for RD/RA, there is no assurance that the institutional controls will be enforced or that compliance monitoring will take place. In addition, EPA will move forward to make final decisions regarding the restrictive covenants that have not been put in place.

Recommendations and Follow-up Actions

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
Lack Of IC Compliance Monitoring	Determine appropriate response action	EPA/MEDEP	EPA/State	Fall 2009	N	Y
Resolution of properties without restrictive covenants	Determine appropriate response action	PRPs	EPA/State	Fall 2009	N	Y

10.0 PROTECTIVENESS STATEMENTS

The remedy components that have been implemented for the 2002 or OU 1 ROD (Non-Source Area groundwater) currently and in the short term protect human health and the environment because voluntary institutional controls, residential water monitoring, and access to public water have been implemented. However, in order for the remedy to be protective in the long-term, the remaining components of the remedy need to be implemented: construction and operation of the hydraulic containment system, long-term monitoring of groundwater, surface water, and sediments, establishment of compliance monitoring of the institutional controls, and an investigation of and appropriate response to the potential vapor intrusion pathway from contaminated groundwater to indoor air. A decision also is needed regarding those properties within the Institutional Control Zone that remain without restrictive covenants and how that might affect the long term protectiveness of the remedy.

The remedy components that have been implemented for the 2006 or OU 2 ROD currently and in the short term protect human health and the environment because voluntary institutional controls have been implemented (all of the homes located above Source Area groundwater were connected to public water during a Removal Action carried out by EPA in 1993-1994). However, in order for the remedy to be protective in the long-term, the remaining components of the remedy need to be implemented: construction and operation of the hydraulic containment system, long-term monitoring of groundwater, surface water, and sediments, establishment of compliance monitoring of the institutional controls, and an investigation of and appropriate response to the potential vapor intrusion pathway from contaminated groundwater to indoor air.

11.0 NEXT REVIEW

The next five-year review for the West Site/Hows Corner Superfund Site will be conducted in 2013. This review is required since hazardous contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.



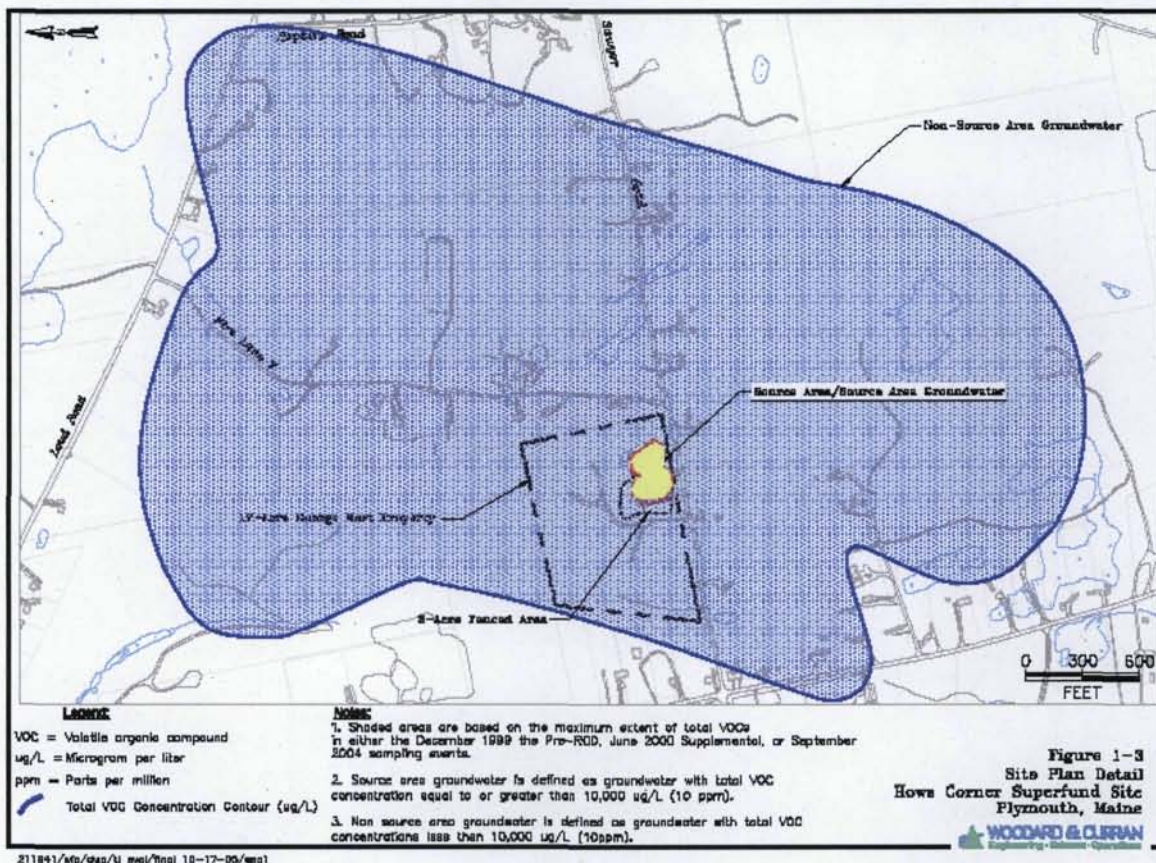


Figure 2: Site Map

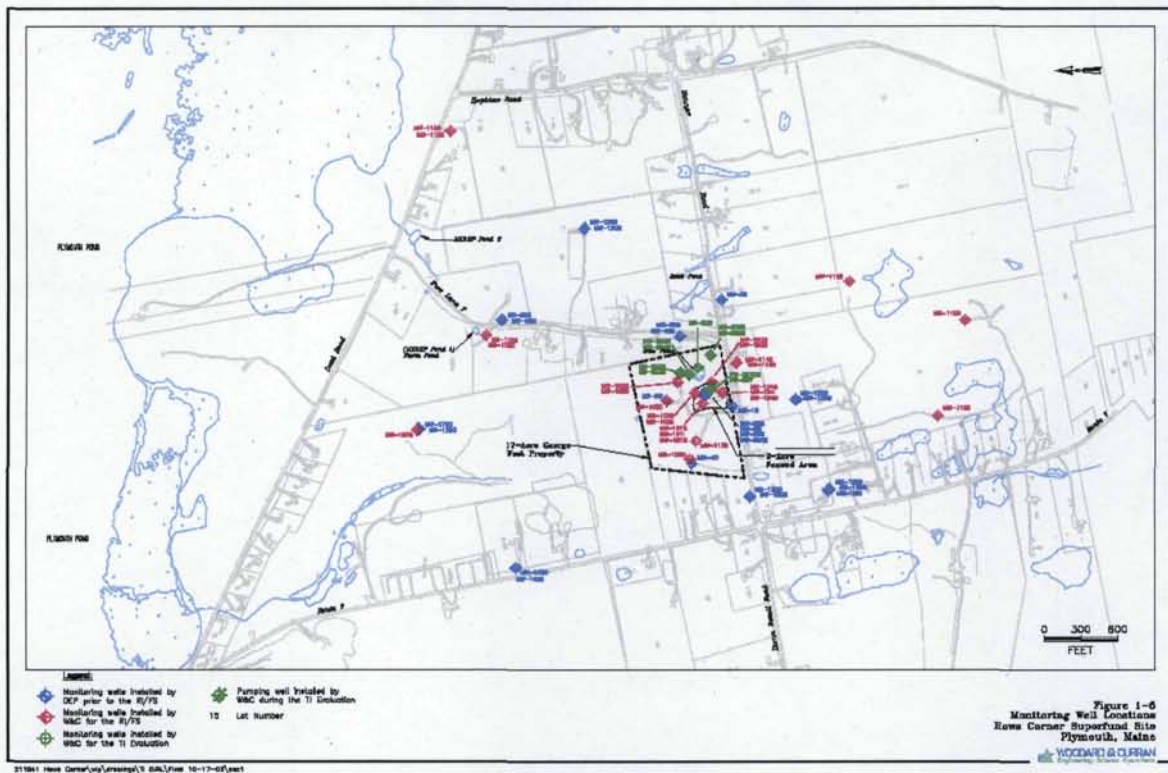
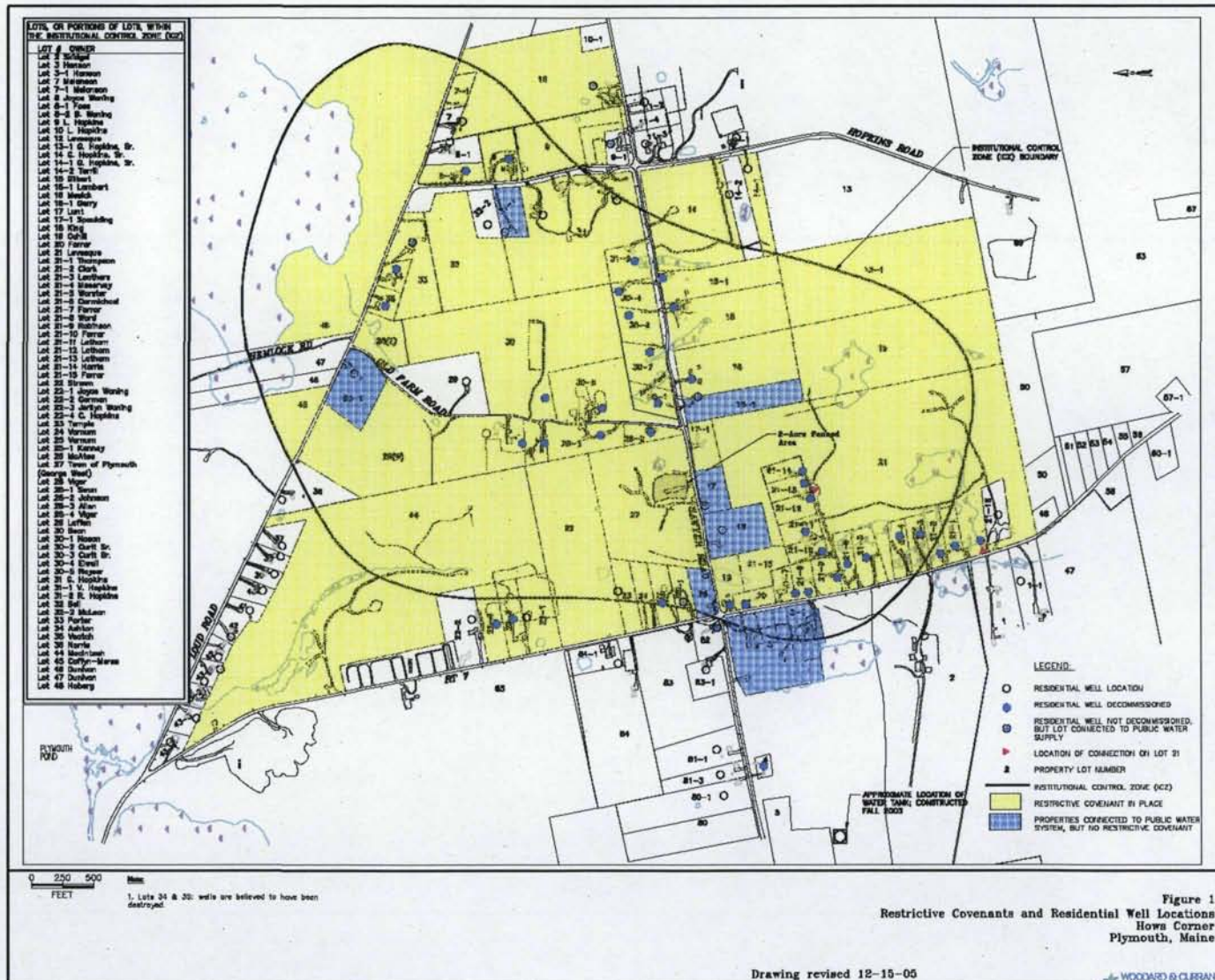


Figure 3: RI/FS Monitoring Well Locations



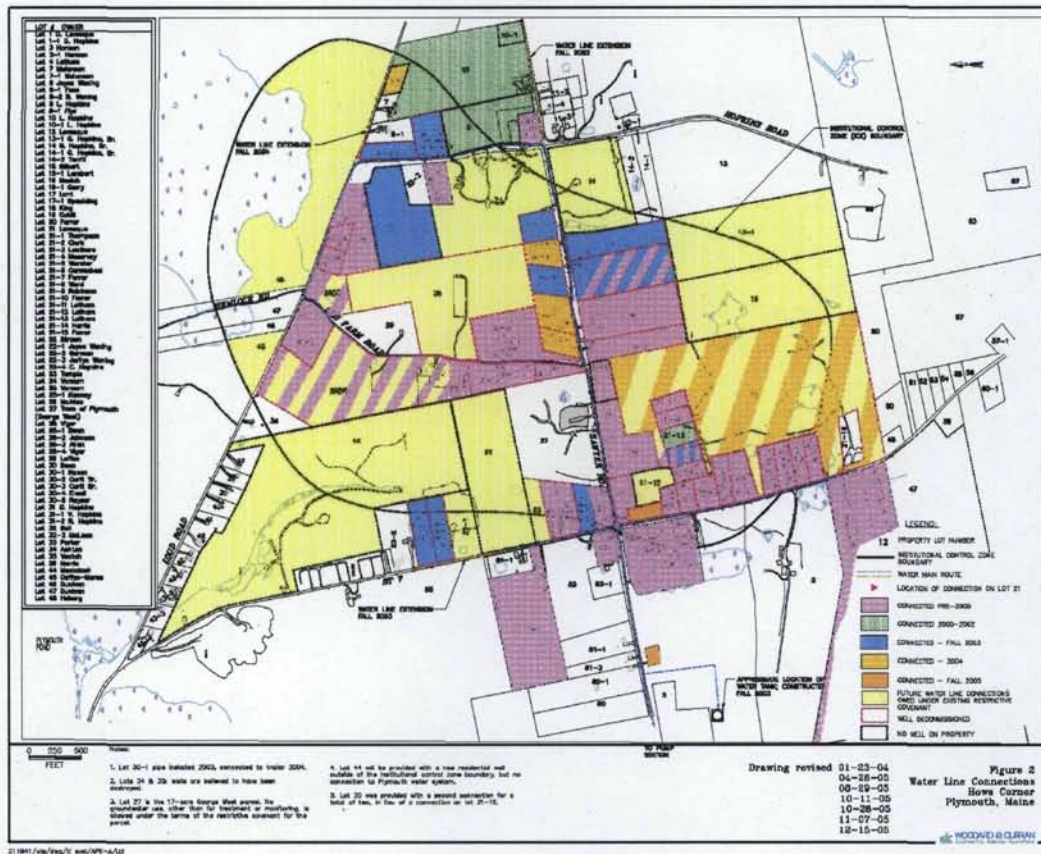


Figure 5: Public Water System

Attachment A: Documents Reviewed

EPA, 1998, *Administrative Order on Consent for Time-Critical Removal Action, Docket No. I-97-1080*
Environmental Protection Agency, Region 1, Boston, Massachusetts, May 28, 1998

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Environmental Protection Agency, Washington, DC, June 2001

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October 2007

2007, *Hows Corner Remedial Design, Long-Term Monitoring and Hydraulic Containment*
System Performance Evaluation Plan, Hows Corner Superfund Site, Plymouth Maine Woodard & Curran,
Inc., October 22, 2007

, 2008, *December 2007 Residential Sampling Results Hows Corner* Woodard & Curran, Inc.,
January 2008

, 2008, *Results from Event Number 1 of Year 0 Long-Term Monitoring Hows Corner*
Superfund Site, Plymouth, Maine Woodard & Curran, Inc., March 6, 2008

, 2008, *March 2008 Residential Sampling Results Hows Corner* Woodard & Curran, Inc., March
2008

, 2008, *June 2008 Residential Sampling Results Hows Corner* Woodard & Curran, Inc., July 2008

Attachment B: Site Inspection Checklist

I. SITE INFORMATION													
Site name: West Site/Hows Corner	Date of inspection: July 23, 2008												
Location and Region: Plymouth, Maine; Region 1	EPA ID:												
Agency, office, or company leading the five-year review: EPA	Weather/temperature: Overcast and humid/70s												
Remedy Includes: (Check all that apply) <table border="0"> <tr> <td><input type="checkbox"/> Landfill cover/containment</td> <td><input checked="" type="checkbox"/> Monitored natural attenuation</td> </tr> <tr> <td><input checked="" type="checkbox"/> Access controls</td> <td><input checked="" type="checkbox"/> Groundwater containment</td> </tr> <tr> <td><input checked="" type="checkbox"/> Institutional controls</td> <td><input type="checkbox"/> Vertical barrier walls</td> </tr> <tr> <td><input type="checkbox"/> Groundwater pump and treatment</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Surface water collection and treatment</td> <td></td> </tr> <tr> <td><input type="checkbox"/> Other</td> <td></td> </tr> </table>		<input type="checkbox"/> Landfill cover/containment	<input checked="" type="checkbox"/> Monitored natural attenuation	<input checked="" type="checkbox"/> Access controls	<input checked="" type="checkbox"/> Groundwater containment	<input checked="" type="checkbox"/> Institutional controls	<input type="checkbox"/> Vertical barrier walls	<input type="checkbox"/> Groundwater pump and treatment		<input type="checkbox"/> Surface water collection and treatment		<input type="checkbox"/> Other	
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<input type="checkbox"/> Groundwater pump and treatment													
<input type="checkbox"/> Surface water collection and treatment													
<input type="checkbox"/> Other													
Attachments: <input checked="" type="checkbox"/> Inspection team roster attached <input type="checkbox"/> Site map attached													
II. INTERVIEWS (Check all that apply)													
1. O&M site manager: Not yet determined <table border="0"> <tr> <td style="text-align: center;">Name</td> <td style="text-align: center;">Title</td> <td style="text-align: center;">Date</td> </tr> <tr> <td colspan="3"> Interviewed <input checked="" type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____ </td> </tr> <tr> <td colspan="3"> Problems, suggestions; <input type="checkbox"/> Report attached: _____ </td> </tr> </table>		Name	Title	Date	Interviewed <input checked="" type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____			Problems, suggestions; <input type="checkbox"/> Report attached: _____					
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Interviewed <input checked="" type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____													
Problems, suggestions; <input type="checkbox"/> Report attached: _____													
2. O&M staff: N/A <table border="0"> <tr> <td style="text-align: center;">Name</td> <td style="text-align: center;">Title</td> <td style="text-align: center;">Date</td> </tr> <tr> <td colspan="3"> Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____ </td> </tr> <tr> <td colspan="3"> Problems, suggestions; <input type="checkbox"/> Report attached _____ </td> </tr> </table>		Name	Title	Date	Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____			Problems, suggestions; <input type="checkbox"/> Report attached _____					
Name	Title	Date											
Interviewed <input type="checkbox"/> at site <input type="checkbox"/> at office <input type="checkbox"/> by phone Phone no. _____													
Problems, suggestions; <input type="checkbox"/> Report attached _____													

3. **Local regulatory authorities and response agencies** (i.e., State and Tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices, etc.) Fill in all that apply.

Agency: Maine DEP

Contact: <u>Rebecca Hewett</u>	<u>Project Manager</u>	<u>July 24, 2008</u>	<u>207 287-8554</u>
Name	Title	Date	Phone no.

Problems; suggestions; ☐ Report attached: MEDEP is and has been actively involved with EPA in the negotiations for the RD/RA consent decree and is aware of the issues that have contributed to the extended duration of the negotiations. Consequently, DEP is looking forward to the conclusion of the negotiations and the implementation of the hydraulic containment system (approved in October 2007). Ms. Hewett also noted that there is current short-term protection because there are institutional controls and periodic monitoring of residential wells relative to the groundwater pathway. However, as the remedy is expected to be in place for decades, she is desirous that the hydraulic containment system be implemented to strengthen long-term protectiveness. Additionally, the State looks forward to formalizing the responsibilities of maintaining the institutional controls which are currently only voluntary. There is also the need to investigate the vapor intrusion pathway.

Agency: Town of Plymouth

Contact:	Name	Title	Date	Phone no.
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Problems; suggestions; ☐ Report attached:

Agency _____

Contact	Name	Title	Date	Phone no.
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Problems; suggestions; ☐ Report attached

Agency _____

Contact	Name	Title	Date	Phone no.
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Problems; suggestions; ☐ Report attached

4. **Other interviews (optional)** ☐ Report attached.

III. ON-SITE DOCUMENTS & RECORDS VERIFIED (Check all that apply)				
1.	O&M Documents <input type="checkbox"/> O&M manual <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date X N/A <input type="checkbox"/> As-built drawings <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date X N/A <input type="checkbox"/> Maintenance logs <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date X N/A Remarks: N/A – there is no ongoing active remediation. Negotiations of the consent decree for RD/RA are underway. A draft O&M plan will be submitted as part of the RD plans and a final plan after the hydraulic containment system is constructed and brought online.			
2.	Site-Specific Health and Safety Plan <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date <input type="checkbox"/> N/A <input type="checkbox"/> Contingency plan/emergency response plan <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date <input type="checkbox"/> N/A Remarks N/A – A HASP will be prepared as one of the RD plans.			
3.	O&M and OSHA Training Records <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date X N/A Remarks _____			
4.	Permits and Service Agreements <input type="checkbox"/> Air discharge permit <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date X N/A <input type="checkbox"/> Effluent discharge <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date X N/A <input type="checkbox"/> Waste disposal, POTW <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date X N/A <input type="checkbox"/> Other permits _____ <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date X N/A Remarks _____			
5.	Gas Generation Records <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date X N/A Remarks _____			
6.	Settlement Monument Records <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date X N/A Remarks _____			
7.	Groundwater Monitoring Records <input type="checkbox"/> Readily available X Up to date <input type="checkbox"/> N/A Remarks: <u>Monitoring reports are sent directly to EPA and MEDEP</u>			
8.	Leachate Extraction Records <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date X N/A Remarks _____			
9.	Discharge Compliance Records <input type="checkbox"/> Air <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date X N/A <input type="checkbox"/> Water (effluent) <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date X N/A Remarks _____			

10.	Daily Access/Security Logs	<input type="checkbox"/> Readily available	<input type="checkbox"/> Up to date	X N/A
	Remarks _____			

IV. O&M COSTS																																																																									
1.	O&M Organization <input type="checkbox"/> State in-house <input type="checkbox"/> Contractor for State <input type="checkbox"/> PRP in-house <input checked="" type="checkbox"/> Contractor for PRP <input type="checkbox"/> Federal Facility in-house <input type="checkbox"/> Contractor for Federal Facility <input type="checkbox"/> Other <u>It is anticipated that the actual routine O&M will be performed by a sub-contractor for the PRPs; the final arrangement has yet to be determined.</u>																																																																								
2.	O&M Cost Records N/A <input type="checkbox"/> Readily available <input type="checkbox"/> Up to date <input type="checkbox"/> Funding mechanism/agreement in place Original O&M cost estimate _____ <input type="checkbox"/> Breakdown attached <div style="text-align: center;">Total annual cost by year for review period if available</div> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">From _____</td> <td style="width: 10%;">To _____</td> <td style="width: 20%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 20%;"></td> <td style="width: 10%; text-align: right;"><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td colspan="4"></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td></td> <td></td> <td></td> <td><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td colspan="4"></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td></td> <td></td> <td></td> <td><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td colspan="4"></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td></td> <td></td> <td></td> <td><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td colspan="4"></td> </tr> <tr> <td>From _____</td> <td>To _____</td> <td></td> <td></td> <td></td> <td></td> <td><input type="checkbox"/> Breakdown attached</td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td colspan="4"></td> </tr> </table>			From _____	To _____					<input type="checkbox"/> Breakdown attached	Date	Date	Total cost					From _____	To _____					<input type="checkbox"/> Breakdown attached	Date	Date	Total cost					From _____	To _____					<input type="checkbox"/> Breakdown attached	Date	Date	Total cost					From _____	To _____					<input type="checkbox"/> Breakdown attached	Date	Date	Total cost					From _____	To _____					<input type="checkbox"/> Breakdown attached	Date	Date	Total cost				
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3.	Unanticipated or Unusually High O&M Costs During Review Period Describe costs and reasons: _____ _____ _____ _____ _____ _____																																																																								
V. ACCESS AND INSTITUTIONAL CONTROLS X Applicable <input type="checkbox"/> N/A																																																																									
A. Fencing																																																																									
1.	Fencing damaged X Location shown on site map X Gates secured <input type="checkbox"/> N/A Remarks: Gates are secured. One section of the chain link fence has been damaged by the "blowdown" of a tree from outside the fence. Ask Dave Dinsmore for a repair schedule																																																																								
B. Other Access Restrictions																																																																									
1.	Signs and other security measures <input type="checkbox"/> Location shown on site map N/A Remarks: <u>Some of the warning signs along the fence have been removed.</u>																																																																								

B. Other Site Conditions	
Remarks:	
VII. LANDFILL COVERS <input type="checkbox"/> Applicable X N/A	
VIII. VERTICAL BARRIER WALLS <input type="checkbox"/> Applicable X N/A	
IX. GROUNDWATER/SURFACE WATER REMEDIES X (Will Be) Applicable <input type="checkbox"/> N/A	
A. Groundwater Extraction Wells, Pumps, and Pipelines X Applicable <input type="checkbox"/> N/A	
1.	Pumps, Wellhead Plumbing, and Electrical <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells properly operating <input type="checkbox"/> Needs Maintenance X N/A Remarks: Not yet installed
2.	Extraction System Pipelines, Valves, Valve Boxes, and Other Appurtenances <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance X N/A Remarks: Not yet installed.
3.	Spare Parts and Equipment <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided X N/A Remarks: _____ _____
B. Surface Water Collection Structures, Pumps, and Pipelines <input type="checkbox"/> Applicable X N/A	
1.	Collection Structures, Pumps, and Electrical <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks: _____ _____
2.	Surface Water Collection System Pipelines, Valves, Valve Boxes, and Other Appurtenances <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks: _____ _____
3.	Spare Parts and Equipment <input type="checkbox"/> Readily available <input type="checkbox"/> Good condition <input type="checkbox"/> Requires upgrade <input type="checkbox"/> Needs to be provided Remarks: _____ _____

C. Treatment System				<input type="checkbox"/> Applicable	<input checked="" type="checkbox"/> N/A
1.	Treatment Train (Check components that apply) <input type="checkbox"/> Metals removal <input type="checkbox"/> Oil/water separation <input type="checkbox"/> Bioremediation <input type="checkbox"/> Air stripping <input type="checkbox"/> Carbon adsorbers <input type="checkbox"/> Filters _____ <input type="checkbox"/> Additive (e.g., chelation agent, flocculent) _____ <input type="checkbox"/> Others _____ <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> Sampling ports properly marked and functional <input type="checkbox"/> Sampling/maintenance log displayed and up to date <input type="checkbox"/> Equipment properly identified <input type="checkbox"/> Quantity of groundwater treated annually _____ <input type="checkbox"/> Quantity of surface water treated annually _____ Remarks: Not yet installed.				
2.	Electrical Enclosures and Panels (properly rated and functional) <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks: Not yet installed.				
3.	Tanks, Vaults, Storage Vessels <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Proper secondary containment <input type="checkbox"/> Needs Maintenance Remarks: Not yet installed.				
4.	Discharge Structure and Appurtenances <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good condition <input type="checkbox"/> Needs Maintenance Remarks: _____ _____				
5.	Treatment Building(s) <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Good condition (esp. roof and doorways) <input type="checkbox"/> Needs repair <input type="checkbox"/> Chemicals and equipment properly stored Remarks: _____ _____				
6.	Monitoring Wells (pump and treatment remedy) <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs Maintenance <input checked="" type="checkbox"/> N/A Remarks: <u>As noted in Section X.D above, some of the monitoring wells are missing well caps</u>				
D. Monitoring Data					
1.	Monitoring Data <input checked="" type="checkbox"/> Is routinely submitted on time <input checked="" type="checkbox"/> Is of acceptable quality				
2.	Monitoring data suggests: <input checked="" type="checkbox"/> Groundwater plume is effectively <u>stabilized</u> <input checked="" type="checkbox"/> Contaminant concentrations are declining <i>at some locations</i>				

E. Monitored Natural Attenuation <input type="checkbox"/> N/A	
1.	Monitoring Wells (natural attenuation remedy) <input type="checkbox"/> Properly secured/locked <input type="checkbox"/> Functioning <input type="checkbox"/> Routinely sampled <input type="checkbox"/> Good condition <input type="checkbox"/> All required wells located <input type="checkbox"/> Needs Maintenance <input type="checkbox"/> N/A Remarks: <u>MNA was selected for the non-source area groundwater. It is dependent on the hydraulic containment system to be viable, and the hydraulic system has not yet been constructed.</u>
X. OTHER REMEDIES	
<p>If there are remedies applied at the site which are not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.</p> <p><u>There may be remedies for vapor intrusion, but an investigation needs to be done first. As with the other components of the RA, performance of the vapor intrusion investigation is dependent on the RD/RA consent decree negotiations schedule.</u></p>	
XI. OVERALL OBSERVATIONS	
A.	Implementation of the Remedy
Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is to accomplish (i.e., to contain contaminant plume, minimize infiltration and gas emission, etc.). Hydraulic containment system, vapor intrusion investigation, and long-term monitoring have not yet been implemented.	
B.	Adequacy of O&M
Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. Not applicable - see above	
C.	Early Indicators of Potential Remedy Problems
Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. Not applicable - see above	
D.	Opportunities for Optimization
Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. Not applicable - see above	

**Five-Year Review Inspection Team Roster
West Site/Howe's Corner SF Site
July 24, 2008**

PRPs' Representatives

Dave Dinsmore, Woodard & Curran Inc

Maine DEP Representatives

Rebecca Hewett, Project Manager

EPA Representatives

Terrence Connelly, Project Manager
Richard Willey, Hydrologist

Attachment C: Maine DEP Comments on September 22, 2008 Draft FYR

September 23, 2008

Mr. Terrence Connelly
U.S. EPA, Reg. 1
1 Congress Street
Suite 1100 (HBT)
Boston, MA 02114-2023

Re: Review of draft September 2008 "First Five-Year Review Report" for the Hows Corner Superfund Site, Plymouth, Maine" received September 22, 2008

Dear Mr. Connelly:

The Maine Department of Environmental Protection (MEDEP) has reviewed the draft "First Five-Year Review Report" text for the Hows Corner Superfund Site, Plymouth, Maine which was prepared by the U.S. Environmental Protection Agency (EPA) and submitted via e-mail to us on September 22, 2008.

The MEDEP understands that this five-year review only evaluates the effectiveness of remedies that have been implemented (i.e., institutional controls, residential water monitoring and access to public water) and our review comments are presented in Attachment A to this letter. None of the MEDEP's comments are substantive and the MEDEP concurs with the issues statements contained in Section 8.0 Issues and in recommendation statements contained in Section 9.0 Recommendations and Follow-Up Action.

Additionally, the MEDEP appreciates the opportunity to be part of the Five-Year Review Report review team and we look forward to working collaboratively with EPA in the future. If you have any questions or concerns regarding this letter, please contact me directly at (207) 287-8554 or at (207) 287-2651.

Sincerely,

Rebecca L. Hewett, Project Coordinator
Division of Remediation
Bureau Remediation & Waste Management

pc: Mary Jane O'Donnell, EPA
Ted Wolfe, MEDEP

5-yrReview draft 9-2008.doc

ATTACHMENT A

1. Page ES-2, 3rd paragraph, 1st sentence: Suggest amending the text to read, "On September 28, 2006 EPA issued a Final ROD that, in addition to the 2002 ROD components, included a technical..."
2. Page 12, Section 4.3.3, 2nd paragraph of section, 2nd sentence: Delete the extra "and to provide alternate" from the sentence.
3. Page 16, Section 6.4.4, 1st paragraph, 2nd sentence: Amend the text to read, "...to assist the town, Maine DEP and EPA in identifying..."
4. Page 17, Section 6.6, 1st paragraph, 1st sentence: Amend the text to read, "...MEDEP, Town of Plymouth and Plymouth Water District officials."
5. Page 19, Section 7.1, 3rd paragraph, last sentence: Suggest amending the sentence to read, "...eliminating potential hydraulic stress on the contaminant plume..."

Attachment D: ARARS and TBCs

CHEMICAL-SPECIFIC ARARS

Requirement	Status	Summary of Requirement
<i>Federal Regulatory Requirements</i>		
Safe Drinking Water Act (SDWA) § 1412 (42 U.S.C. § 300 g-1, 40 C.F.R. §§ 141.11 to 141.6)	Relevant and Appropriate	Maximum Contaminant Levels (MCLs) have been promulgated for several common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies, but may also be considered relevant and appropriate for groundwater aquifers used for drinking water.
SDWA § 1412 (42 U.S.C. § 300 g-1, 40 C.F.R. §§ 141.50 to 141.51)	Relevant and Appropriate	Non-zero Maximum Contaminant Level Goals (MCLGs) are health-based criteria established for a number of organic and inorganic contaminants as water quality goals for drinking water supplies. These goals may also be considered for groundwater aquifers used for drinking water.
<i>State of Maine Regulatory Requirements</i>		
Maine Drinking Water Rules (10-144 C.M.R. Chapter 231) <i>Amended March 12, 2008</i>	Relevant and Appropriate	Maine's Primary Drinking Water Standards are equivalent to federal MCLs.
Rules Relating to Testing of Private Water Systems for Potentially Hazardous Contaminants (10-144 C.M.R. Chapter 233, Appendix C).	Relevant and Appropriate	These rules establish criteria for potentially hazardous contaminants occurring in private residential water systems.
Hazardous Waste Management Rule (06-096 C.M.R. Chapter 854).	Relevant and Appropriate	This rule establishes performance standards for establishment, construction, alteration, and operation of hazardous waste management units, including miscellaneous units. "No landfilled hazardous waste or constituent or derivative thereof shall appear in ground or surface waters at a concentration above background level, or above current public health drinking water standards for Maine, including the Maximum Exposure Guidelines, or standards for aquatic toxicity, whichever is more stringent." (Chapter 854, 58(A)(3)(a))
Draft Interim Maximum Exposure Guidelines (MEGs) (Bureau of Health, Maine Department of Human Services, July 28, 2008)	To Be Considered	Health-based guidelines developed for drinking water by the Bureau of Health Environmental Toxicology Program.

ACTION-SPECIFIC ARARS

Requirement	Status	Requirement Synopsis
Groundwater and Surface Water		
<i>Federal Regulatory Requirements</i>		
Clean Water Act (CWA) § 304(a) (33 U.S.C. §1314(a))	Relevant and Appropriate	Federal Ambient Water Quality Criteria (AWQC) include (1) health-based criteria developed for 95 carcinogenic and non-carcinogenic compounds and (2) other water quality parameters protective of fish and aquatic life. AWQC for the protection of human health provide levels for exposure from drinking water and consuming aquatic organisms, and from consuming fish alone.
Resource Conservation and Recovery Act (RCRA, 42 USC 6901-6992) - Groundwater Protection	Relevant and Appropriate	This regulation outlines the requirements for groundwater monitoring for RCRA-permitted hazardous waste Treatment, Storage, and Disposal (TSD) facilities.
Underground Injection Control Regulations (40 CFR Parts 144, 145, 146, and 147)	Relevant and Appropriate	These regulations provide compliance standards for radioactive and hazardous waste that is injected underground. Injection must not endanger health or drinking water supplies.
RCRA – Identification and Listing of Hazardous Wastes (40 CFR 261)	Applicable	Defines those wastes that are subject to regulations as hazardous wastes under 40 CFR Parts 264-265 and Parts 124, 270, and 271.
RCRA – General Facility Standards (40 CFR 264.18)	Relevant and Appropriate	These regulations outline requirements for owners and operators of hazardous waste treatment, storage, and disposal facilities with respect to general waste analysis, security, general inspection requirements, personnel training, location standards, and general requirements for ignitable, reactive, or in compatible wastes.
RCRA - Contingency Plan and Emergency Procedures (40 CFR 264.50-264.56)	Relevant and Appropriate	These regulations outline the requirements for emergency procedures to be used following explosions, fires, etc., and they outline emergency procedures and requirements for the development of contingency plans.
RCRA - Tank Systems (40 CFR 264.190-264.200)	Relevant and Appropriate	These regulations outline the general operating requirements and inspections of existing or newly installed tank systems. Specifically, containment and detection of releases is regulated, as well as responses to leaks or spills and special requirements for ignitable, reactive, and incompatible wastes.
RCRA - Air Emission Standards (40 CFR 264.1030-264.1036)	Relevant and Appropriate	These regulations outline standard emissions for process vents, closed-vent systems, and control devices. Requirements for test methods, procedures, recordkeeping, and reporting are also outlined.

ACTION-SPECIFIC ARARS (cont)

Requirement	Status	Requirement Synopsis
Groundwater and Surface Water (cont)		
RCRA - Preparedness and Prevention (40 CFR 264.30-264.37)	Relevant and Appropriate	This regulation outlines requirements for safety equipment and spill-control requirements for hazardous waste facilities. <i>This regulation specifies that facilities be designed, maintained</i>
State of Maine Regulatory Requirements		
Maine Rules to Control the Subsurface Discharge of Pollutants by Well Injection (38 M.R.S.A., Chapter 3, Section 413, Chapter 543) <i>Repealed and replaced October 3, 2006</i>	Relevant and Appropriate	This regulation prohibits the injection of hazardous waste into or above water-bearing formations via a new Class V well. The subsurface discharge into or through a Class V well that would cause or allow the movement of fluid into an underground source of drinking water that may result in a violation of any Maine Primary Drinking Water Standard, or which may otherwise adversely affect public health, is prohibited.
Air		
State of Maine Regulatory Requirements		
Maine Air Quality Control Laws; Protection and Improvements of Air (38 M.S.R.A. 581-608-A), Chapters 101, 105, 110, 115.	Relevant and Appropriate	This law and its associated regulations detail the requirements, limitations, and exemptions of state air emissions including fugitive dust and emissions from air strippers.
Interim Ambient Air Guidelines	TBC	These guidelines provide ambient air standards used to set emissions.
38 M.R.S.A CMR 530.5	Relevant and Appropriate	Includes state ambient water quality criteria for direct and indirect sources.
Maine Hazardous Waste Septage and Solid Waste Management Act, 38 M.R.S.A 13, Chapters 850, 851, 853-857	Relevant and Appropriate	Includes state requirements for the management of waste.
Maine Classification of Waters Program 38 M.R.S.A. 465-C, 464(4)(A)(1)	Applicable	Provides for classification of Maine's surface and groundwater.

LOCATION-SPECIFIC ARARS

Requirement	Status	Summary of Requirement
Wetlands/Floodplains		
<i>Federal Regulatory Requirements</i>		
Wetland Executive Order (EO11990), 40 C.F.R. Part 6, Appendix A	Applicable	The Wetlands Executive Order requires federal agencies to minimize the destruction, loss, or degradation of wetlands, and preserve and enhance natural and beneficial values of wetlands. Activity in a wetland is prohibited unless there is no practical alternative. If there is no practical alternative, impacts must be minimized.
Clean Water Act (CWA) § 404 Requirements for Dredged or Fill Material (33 U.S.C. § 1344, 40 C.F.R. Part 230)	Applicable	Under this requirement, no activity that adversely affects a wetland shall be permitted if a practicable alternative is available. There is no practical alternative to this alternative.
<i>State of Maine Regulatory Requirements</i>		
Maine Natural Resources Protection Act (NRPA, 38 M.R.S.A. §§ 480-A to 480-Z) Wetland Rules, Permit By Rule Standards (06-096 C. M.R. Chapters 305 and 310)	Applicable	This act outlines requirements and performance standards for certain activities in, on, over, or adjacent to freshwater wetlands, streams, ponds, or brooks. The activities must not unreasonably interfere with certain natural features, such as natural flow or quality of any waters, nor harm significant aquatic habitat, freshwater fisheries, or other aquatic life.
Erosion and Sedimentation Control (38 M.R.S.A., Subsec. 420-C), Chapter 500, Stormwater Management Rules	Applicable	Erosion control measures must be implemented prior to the start of activities such as the displacement, filling, or exposure of any soil of earthen materials